

DEPARTMENT OF NEUROSURGERY  
COLLEGE OF MEDICINE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: 03/01/2018

PROJECT TITLE: Metabolic changes after chronic traumatic brain injury

Laura Ngwenya, MD, PhD  
Department of Neurosurgery  
Director, UCGNI Neurotrauma Center  
231 Albert Sabin Way  
MSB Room 5251  
ngwenyla@ucmail.uc.edu  
phone: 513-558-5081  
fax: 513-558-5673

Jennifer McGuire, PhD  
Department of Neurosurgery  
231 Albert Sabin Way  
MSB Room 5103  
kozioljl@ucmail.uc.edu  
phone: 513-558-3594

**Project Description**

Acute changes in ion currents, neurotransmitter release, and glucose metabolism are sufficient to cause initial functional deficits after traumatic brain injury (TBI). However, it is not clear whether these metabolic lesions persist into chronic stages, or the extent to which they contribute to long-term impairments. This project will investigate molecular changes in the transport and metabolism surrounding two critical sources of cellular energy required for synaptic transmission, glucose and lactate, in the hippocampus. This research involves TBI injured rodent brain tissue, collected under UC IACUC approved protocols. The WISE student will learn and participate in the collection and analysis of data collected using standard molecular biology techniques measuring protein levels and enzyme activity.